

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Paul Silinger

Application No.: 10/765782

Group No.: 1753

Filed: June 11, 2003

Examiner: Luan V. Van

For: **INTERNAL HEAT SPREADER PLATING METHODS AND DEVICES**

**MAIL STOP PETITIONS**  
**COMMISSIONER FOR PATENTS**  
**P.O. Box 1450**  
**ALEXANDRIA, VA 22313-1450**

**APPELLANT'S PETITION TO THE DIRECTOR UNDER 37 CFR § 1.181**

I, the undersigned, Sandra Poteat Thompson, hereby petition the USPTO as follows:

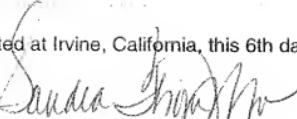
1. I am the attorney of record for Honeywell International Inc. and am a Shareholder with Buchalter Nemer, a Professional Corporation. I also have a Doctor of Philosophy (PhD) degree in Chemistry with concentrations in Analytical, Organic and Environmental Chemistry from North Carolina State University.
2. On March 9, 2007, I filed a Notice of Appeal with the USPTO on behalf of Honeywell International Inc. for the above-referenced case.
3. On May 9, 2007, I filed the corresponding Appeal Brief with the USPTO in the same above-referenced case.
4. On or about September 8, 2007, I received and reviewed the Examiner's Answer related to this case. During my review of the Examiner's Answer, I realized that the paragraph on Page 12 (first full paragraph) related to Independent Claim 15 had not been included in any prior action or brought up by the Examiner in any other correspondence regarding this case. The Examiner's Answer is herein included as Exhibit A.
5. On review of the documents in this case, I confirmed that the first full paragraph on Page 12 related to the Examiner's interpretation of Claim 15 had not been

previously presented by the Examiner.

6. In my Reply Brief filed on November 6, 2007, I noted that the statement by the Examiner is new in this case and can be interpreted to have two meanings, and therefore, isn't clear. The Reply Brief is attached as Exhibit B with the relevant argument starting on Page 21.
7. The Applicant will be unduly prejudiced by the Examiner's statement, if this matter isn't ruled a new ground of rejection, because the Applicant cannot properly analyze and possibly amend Claim 15 during the current Appeals process.
8. The Applicant respectfully requests the Director to issue a statement that the statement on Page 12 of the Examiner's Answer brings up a new ground of rejection.
9. I hereby declare that all statements made herein of my own knowledge are true and that statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Section 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Executed at Irvine, California, this 6th day of November, 07.

By:



Sandra Poteat Thompson, PhD  
Registration Number: 46,264

Dated: November 6, 2007

By:

Respectfully submitted,  
Buchalter Nemer, A Prof. Corporation



Sandra P. Thompson, PhD, Esq.  
Reg. No. 46,264  
E-mail: [sthompson@buchalter.com](mailto:sthompson@buchalter.com)  
Direct Line: 949-224-6282

ATTORNEYS FOR APPLICANT(S):

Buchalter Nemer, A Professional Corporation  
18400 Von Karman Ave., Suite 800  
Irvine, CA 92612  
Fax: 949-224-6203

# Exhibit A



# UNITED STATES PATENT AND TRADEMARK OFFICE

H9925-2905

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: 1500 M STREET, N.W., ROOM 1150  
P.O. Box 1150  
Arlington, Virginia 22313-1150  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,782	06/11/2003	Paul Slinger	H002233 US - 4018/H9925-	2472
62593	7590	09/06/2007		
BUCHALTER NEMER 18400 VON KARMAN AVE. SUITE 800 IRVINE, CA 92612			EXAMINER VAN, LUAN V	
			ART UNIT PT33	PAPER NUMBER
			MAIL DATE 09/06/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

MAILED  
SEP 06 2007  
GROUP 170C

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/765,782  
Filing Date: June 11, 2003  
Appellant(s): SILINGER ET AL.

Sandra Thompson  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed May 9, 2007 appealing from the Office action mailed November 13, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct. The examiner notes that the "first independent claim" refers to claim 1, while the "second independent claim" refers to claim 15.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

The 103 portion of the 102/103 rejection of claims 1, 2, 9 and over Admitted Prior Art (Fig. 1, Page 1 of applicant's disclosure) is withdrawn.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

Applicant's Admitted Prior Art as shown in Fig. 1 of the Specification.

4772371

Lace et al.

09-1988

#### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

##### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

##### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 9 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by Admitted Prior Art (Fig. 1, Page 1 of applicant's disclosure).

Regarding claim 1, Admitted Prior Art teaches a plating system comprising: an elongated upper channel and an elongated lower channel (shown in Prior Art Fig. 1 of the disclosure); and a plating solution sparger 11 in Fig. 1 comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels. The plating solution inlets to the vertical spargers of Admitted Prior Art as shown in Fig. 1 are broadly interpreted to be a horizontal sparger.

Regarding claim 2, Admitted Prior Art teaches the system of further comprising: an anode 14; and a substantially planar cathode 90 comprising a first surface conductive surface, a second conductive surface, and a perimeter edge, the first conductive surface and second conductive surface being substantially parallel to each other and positioned on opposite sides of the cathode; wherein the sparger 11 is positioned at least as close to the perimeter edge of the cathode as to either of the first or second conducting surface (see Fig. 1).

Regarding claim 9, Admitted Prior Art teaches the sparger is positioned horizontally and directs any plating solution flowing through the inlets into the lower channel and towards the upper channel (see Fig. 1).

Regarding claim 12, Admitted Prior Art teaches a plurality of anodes 14 positioned outside and along the length of the upper and lower channels (see Fig. 1).

***Claim Rejections - 35 USC § 103***

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in view of Lace et al. (assuming Admitted Prior Art does not teach a horizontal sparger).

Regarding claim 1, Admitted Prior Art teaches a plating system comprising: an elongated upper channel and an elongated lower channel (shown in Prior Art Fig. 1 of the disclosure); and a plating solution sparger 11 in Fig. 1 comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels.

Admitted Prior Art differ from the instant claims in that the reference does not explicitly teach the horizontal sparger.

Lace et al. teach a sparger 25 comprising a plurality of inlets 48 (Fig. 5) to permit the flow of electrolyte towards the cathode in a plane substantially coplanar with the cathode 66.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Admitted Prior Art by using the

horizontal sparger of Lace et al., because it would permit the substrate to receive fresh electrolyte continuously and to continuously discharge partially-spent electrolyte during cell operation, and because it would permit higher current densities to be used without adverse affect upon the plated deposit (column 2 lines 53-62 of Lace et al.).

Further, Admitted Prior Art differs from the instant claims in that the Admitted Prior Art teaches a sparger directing a plating solution flowing through the inlets towards the cathode but does not explicitly disclose the flow is in a plane substantially coplanar with the cathode (claim 3); nor the specific width of the channel dimensions (claims 8, 10, 11 and 14).

Lace et al. teach an electroplating apparatus for high-speed electroplating a cathodic strip of metal passed there through. The apparatus includes an elongated cell subdivided into a plurality of sub-cells defined by bottom and side walls and slotted partition walls for passage of the strip from one sub-cell to the next. Each sub-cell is provided with a pair of anodes, and means are provided for circulating electrolyte continuously in and through each sub-cell. (See abstract.) Lace et al. additionally teach a sparger 25 comprising a plurality of inlets 48 (Fig. 5) to permit the flow electrolyte towards the cathode in a plane substantially coplanar with the cathode 66.

Regarding claim 3, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the sparger of Admitted Prior Art by using the flow distributor of Lace et al. such that the flow is in a plane substantially coplanar with the cathode, because it would enable the substrate to be plated with high current densities and with high efficiency, thus resulting in a greater

Art Unit: 1753

quantity of material, i.e. a greater length of strip, to be uniformly electroplated in unit time in an apparatus occupying the space of a larger conventional cell or, expressed another way, equivalent amounts of material can be electroplated in a cell occupying less space (column 6 lines 18-27 of Lace et al.)

Regarding claims 8, 10, 11 and 14, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have recognized that the distance between the shield and the cathode affects the degree in which the electric field lines, extending from the anode to the cathode, reach the edge of the cathode or substrate. It is known that charge buildup tends to occur at edges of the cathode substrate causing a greater concentration of material deposition to occur in these areas and thus resulting in nonuniformity of the electroplated metal on the substrate. It would have been obvious to one having ordinary skill to have modified the distance between the shield and the cathode of Admitted Prior Art through routine experimentation in order to prevent charge buildup at the cathode substrate edges and thus reducing nonuniformity in the electroplated metal. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have reduced the distance between the shield and the cathode of Admitted Prior Art, because electroplating apparatus can be made to occupy less space.

Regarding claim 4, Admitted Prior Art teaches each of the upper and lower channels comprises two substantially planar and parallel non-electrically conductive sides (page 1, lines 17-18, applicant's disclosure) that are substantially parallel to the

cathode; and the cathode is positioned at least partially within each of the upper and lower channels between the non electrically conductive sides (see Fig. 1).

Regarding claim 5, Admitted Prior Art teaches the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots (see Fig. 1); and the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots (see Fig. 1).

Regarding claim 6, Admitted Prior Art teaches the egress slots are positioned approximately parallel to a center line of the cathode (see Fig. 1).

Regarding claim 7, the apparatus of Admitted Prior Art is structurally capable of plating a cathode comprising a dielectric substrate and conductive surfaces.

Regarding claim 13, Admitted Prior Art teaches the upper channel and lower channel are separated by a distance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Admitted Prior Art by varying the distance, because it would allow substrates of different sizes to be uniformly electroplated.

Regarding claim 15, Admitted Prior Art teaches a plating system comprising: an anode 14 (Fig. 1, and page 1 of the instant disclosure), a planar cathode 90, a sparger 11, and a plurality of electrically insulating shields 13; wherein each of the plurality of shields is positioned between the anode and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are

Art Unit: 1753

substantially parallel to the cathode; and the sparger is adapted to direct plating fluid toward and edge of the cathode.

Admitted Prior Art teaches the apparatus as described above. Admitted Prior Art differs from the instant claims in that the Admitted Prior Art teaches a sparger directing a plating solution flowing through the inlets towards the cathode but does not explicitly disclose the flow is in a plane substantially coplanar with the cathode.

Lace et al. teach an electroplating apparatus for high-speed electroplating a cathodic strip of metal passed therethrough. The apparatus includes an elongated cell subdivided into a plurality of sub-cells defined by bottom and side walls and slotted partition walls for passage of the strip from one sub-cell to the next. Each sub-cell is provided with a pair of anodes, and means are provided for circulating electrolyte continuously in and through each sub-cell. (See abstract.) Lace et al. additionally teach a sparger 25 comprising a plurality of inlets 48 (Fig. 5) to permit the flow electrolyte towards the cathode in a plane substantially coplanar with the cathode 66.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the sparger of Admitted Prior Art by using the flow distributor of Lace et al. such that the flow is in a plane substantially coplanar with the cathode, because it would enable a substrate to be plated with high current densities and with high efficiency, thus resulting in a greater quantity of material, i.e. a greater length of strip, to be uniformly electroplated in unit time in an apparatus occupying the space of a larger conventional cell or, expressed another way, equivalent amounts of material can be electroplated in a cell occupying less space (column 6 lines 18-27 of

Lace et al.). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the apparatus of Admitted Prior Art by using the horizontal sparger of Lace et al., because it would permit the substrate to receive fresh electrolyte continuously and to continuously discharge partially-spent electrolyte during cell operation, and because it would permit higher current densities to be used without adverse affect upon the plated deposit (column 2 lines 53-62 of Lace et al.).

**(10) Response to Argument**

The applicant argues on page 6 that the applicant's Admitted Prior Art does not teach a plating solution horizontal sparger. The examiner respectfully disagrees. The applicant defines the horizontal sparger as a series of inlets in the lower plenum to direct plating solution flowing through the inlets into the lower channels. The examiner asserts, as stated on page 3 of the final Office Action mailed November 13, 2006 and clarified in the Advisory mailed on April 21, 2007, that the **series of inlets** -- not the vertical spargers -- on the bottom of the plating compartment 12 of Fig. 1 for feeding the plating solution into the vertical spargers are interpreted to read on the horizontal spargers of the instant claims.

The applicant quotes the examiner's phrase in the final Office Action that "the vertical spargers of Admitted Prior Art as shown in Fig. 1 are broadly interpreted to be a horizontal sparger." However, the examiner's phrase has been taken out of context. The examiner actually stated, on page 3 of the final Office Action, that "[t]he plating solution **inlets** to the vertical spargers of Admitted Prior Art as shown in Fig. 1 are

broadly interpreted to be a horizontal sparger." To reiterate, it is the series of inlets on the bottom of the plating compartment 12 of Fig. 1 for feeding the plating solution into the vertical spargers, and not the vertical spargers themselves, that are interpreted to read on the horizontal spargers of the instant claims.

The applicant further argues that the instant application eliminates the tubular vertical spargers of Admitted Prior Art and replaces them with horizontal spargers. As stated in the Advisory, independent claims 1 and 15 use "comprising" language, therefore, even though the Admitted Prior Art provides the vertical spargers 11 on the series of inlets (i.e., horizontal spargers), the Admitted Prior Art reads on the instant claims.

The applicant further argues on page 10 that the instant invention improves on the Admitted Prior Art by increasing the solution velocity, moving the shields closer to the parts to be plated, incorporating part hoarding clamps, and incorporating a couple rinsing and drying process. However, the applicant is arguing limitations or advantages that are not in the independent claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The applicant further argues on page 11 that that the Lace reference does not disclose replacing the vertical spargers with a horizontal sparger. This may be true. However, the examiner relies on the Lace reference to teach the use of a horizontal sparger. It would have been obvious to one having ordinary skill in the art to have replaced the vertical spargers of Admitted Prior Art with the horizontal sparger of Lace

Art Unit: 1753

et al., because it would permit the substrate to receive fresh electrolyte continuously and to continuously discharge partially-spent electrolyte during cell operation (column 2 lines 53-62 of Lace et al.) as stated on page 5 of the final Office Action.

It is further noted that since the examiner is not relying on the vertical spargers to meet the horizontal sparger of the instant claims, the plurality of shields 13 of Admitted Prior Art is not between the sparger and the cathode as stated in claim 15.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Luan V. Van

Conferees:



Nam Nguyen

/Jennifer Michener/

Quality Assurance Specialist, TC1700

Jennifer Michener

# Exhibit B

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Paul Silinger

Application No.: 10/765782

Group No.: 1753

Filed: June 11, 2003

Examiner: Luan V. Van

For: **INTERNAL HEAT SPREADER PLATING METHODS AND DEVICES**

**MAIL STOP APPEAL BRIEF – PATENTS**  
**COMMISSIONER FOR PATENTS**  
**P.O. Box 1450**  
**ALEXANDRIA, VA 22313-1450**

**APPELLANT'S REPLY BRIEF UNDER 37 CFR § 41.41**

This reply brief follows the Examiner's Answer dated September 6, 2007. The fees required under 37 CFR §1.17(f) are included with this brief.

This brief contains the following items under the headings in the order here indicated:

**APPELLANTS REPLY BRIEF UNDER 37 CFR § 41.41**

REAL PARTY IN INTEREST

RELATED APPEALS AND INTERFERENCES

STATUS OF THE CLAIMS

STATUS OF AMENDMENTS

SUMMARY OF CLAIMED SUBJECT MATTER

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

ARGUMENT

CLAIMS APPENDIX

EVIDENCE APPENDIX

RELATED PROCEEDINGS APPENDIX

**REAL PARTY IN INTEREST**

The real party in interest is the assignee, Honeywell International Inc. (see Reel/Frame No. 012910/0226, Recorded on May 20, 2002)

**RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences in this matter known to appellant.

**STATUS OF THE CLAIMS**

There are 18 claims in this case.

Claims 16-18 were canceled in the Response to the First Office Action dated April 10, 2006.

Claims 1-15 stand rejected.

Claims 1-15 are being appealed.

**STATUS OF AMENDMENTS**

There have been no amendments filed subsequent to final rejection in this matter.

**SUMMARY OF THE CLAIMED SUBJECT MATTER**

The subject matter of the present application, including independent claims 1 and 15, is directed to plating systems for heat spreaders and other related parts.

The first independent claim is directed to a plating system comprising: an elongated upper channel and an elongated lower channel (Page 2, lines 2-13); and a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels. (Page 2, lines 2-13)

The second independent claim is directed to a plating system comprising: an anode (Page 2, lines 9-13), a planar cathode (Page 4, lines 2-5), a horizontal sparger (Page 3, lines 17-25, Page 4, lines 8-15 and Figure 2), and a plurality of electrically insulating shields (Page 6, lines 19-25); wherein each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode (Figures 2 and 3 – entire Figures as presented); and the sparger is adapted to direct plating fluid toward and edge of the cathode along in a plane substantially co-planar with cathode. (Figures 2 and 3 – entire Figures as presented, Page 6, lines 4-9)

**GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1, 2, 9 and 12 are rejected under 35 USC §102(b) as being anticipated by Admitted Prior Art (Fig. 1, Page 1 of the Applicant's disclosure) or, in the alternative, under 35 USC §103(a) as obvious over Admitted Prior Art.

Claims 1-15 are rejected under 35 USC §103(a) as being unpatentable over Admitted Prior Art in view of Lace et al.

Claim 15 has a new ground of rejection based on the Examiner's assertion that the plurality of shields 13 of Admitted Prior Art is not between the sparger and the cathode, as stated in Claim 15.

**ARGUMENT**

**ISSUE NO. 1 - §102 AND 103 REJECTION OF CLAIMS 1, 2, 9 AND 12 BASED ON APPLICANT'S ADMITTED PRIOR ART**

Claims 1, 2, 9 and 12 are rejected under 35 USC §102(b) as being anticipated by Admitted Prior Art (Fig. 1, Page 1 of the Applicant's disclosure) or, in the alternative, under 35 USC §103(a) as obvious over Admitted Prior Art. The Applicants respectfully disagree.

Claim 1 recites:

"A plating system comprising:  
an elongated upper channel and an elongated lower channel; and  
a plating solution horizontal sparger comprising a series of inlets oriented to  
direct any plating solution flowing through the inlets into one and towards  
another of the upper and lower channels."

As pointed out in the Specification, an improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields forming the sides of the channel).

As the Specification also specifically points out, the system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 – and Applicant's

Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried. These modifications to the Technic system render the claims of the current application patentable as not anticipated by Technic, because Technic cannot possibly anticipate the modifications disclosed in the current system and recited in the claims.

The Applicant believes, after reviewing the Examiner's Answer, that the Examiner is merely assembling puzzle pieces to arrive at a whole "prior art reference", and the Examiner is also improperly deconstructing claim 1 of the present application to arrive at the goal the Examiner wishes to reach.

#### **REVIEW OF PENDING CLAIM 1 "As A Whole"**

First, it is important to read claim 1 as a whole. Claim 1 states that a plating system comprises the following: a) an elongated upper channel and an elongated lower channel; and b) a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels. (emphasis added) The Examiner states that the "comprising" language means that Claim 1 could include vertical spargers attached to the series of inlets, and therefore, Claim 1 reads on Applicant's Admitted Prior Art. This analysis and result is inherently faulty. That provision – as a whole – states "a

plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels". Two things are apparent from a fair reading of this claim: 1) the plating solution is flowing through the inlets and into one of the channels – not into a sparger and then into a channel, and 2) the plating solution is flowing into one of the channels and toward another channel – not flowing toward the face of the piece to be plated, as is the case with Applicant's Admitted Prior Art.

**PROPOSED CLAIM AMENDMENTS FOR CONSIDERATION BY EXAMINER/BOARD**

The Applicant could amend claim 1, in part, to state the following:

a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets directly into one and towards another of the upper and lower channels, or

a plating solution horizontal sparger comprising consisting of a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels.

The Applicant does not believe that either amendment presented above is necessary, because as the Applicant contends, the claim provision does in fact speak for itself and does not read on Applicant's Admitted Prior Art; however, the Applicant respectfully presents two options shown above that either the Examiner or the Board could accept and recommend. If the Examiner believes one of these options is acceptable, the Applicant will withdraw the Appeal through the filing of a Request for

Continued Examination that includes one of the above amendments. It should be clear, however, that the Applicant is respectfully seeking to work with the Examiner in this case to move this matter forward to allowance, instead of wasting resources through the Appeal process. If, however, the Examiner does not agree with the Applicant's arguments or proposed amendments, then the Applicant is satisfied asking the Board to review the matter and make a reasoned recommendation or determination.

**INCORRECT ASSERTION OF OMISSION OF ELEMENTS AND FUNCTIONS AS OBVIOUS**

Second, the Applicant would like to address a comment by the Examiner from the November 13, 2006 Office Action, page 3, last paragraph. The Examiner states the following:

"Moreover, it would have been obvious to one having ordinary skill in the art to have omitted the vertical spargers if uniform direct flow to the plating substrate is not desired. According to MPEP 2144.04, omission of an element and its function is obvious if the function of the element is not desired."

This statement by the Examiner is quite significant and wholly incorrect. The polybasic acid salts in the MPEP example were not desired or required, such as in compositions for providing corrosion resistance in environments which do not encounter fresh water. Therefore, if the fresh water is removed – there is no need for the salts. The sparger function of the Applicant's Admitted Prior Art was not removed – it was just redesigned to operate differently and more efficiently. But, the function of the sparger – to direct fluid into or onto an area or surface was kept in the Applicant's embodiment. The Examiner's attention is drawn to the immediately following paragraph in that same section of the MPEP:

Note that the omission of an element and retention of its function is an indicia of unobviousness. *In re Edge*, 359 F.2d 896, 149 USPQ 556 (CCPA 1966) (Claims at issue were directed to a printed sheet having a thin layer of erasable metal bonded directly to the sheet wherein said thin layer obscured the original print until removal by erasure. The prior art disclosed a similar printed sheet which further comprised an intermediate transparent and erasure-proof protecting layer which prevented erasure of the printing when the top layer was erased. The claims were found unobvious over the prior art because the although the transparent layer of the prior art was eliminated, the function of the transparent layer was retained since appellant's metal layer could be erased without erasing the printed indicia.).

In this case, an element has been removed, but the function of a sparger has been retained. The Examiner again is clearly piecing together puzzle pieces to arrive at a desired result, instead of examining the claim and the Applicant's application as a whole. This action on the Examiner's part is improper hindsight examination and should be rejected by the Board.

#### **CONCLUSION**

Based on this argument, along with the arguments presented in the Applicant's Appeal Brief, Applicant's Admitted Prior Art does not anticipate claim 1 of the present application because Applicant's Admitted Prior Art is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claim 1.

Claim 1 is therefore allowable as not being anticipated by Applicant's Admitted Prior Art. Further, Applicant's Admitted Prior Art does not anticipate claims 2, 9 and 12 of the present application by virtue of their dependency on claim 1.

In addition, Applicant's Admitted Prior Art cannot render unpatentable claim 1 of the present application, because one of ordinary skill in the art cannot possibly review the Admitted Prior Art on its face and, remove the vertical spargers, place horizontal spargers in the bottom of the chamber and arrive at claim 1.

**ISSUE NO. 2 - §103 (A) REJECTION OF CLAIMS 1-15 BASED ON APPLICANT'S ADMITTED PRIOR ART IN VIEW OF LACE ET AL.**

Claims 1-15 are rejected under 35 USC §103(a) as being unpatentable over Admitted Prior Art in view of Lace et al. The Applicants respectfully disagree.

Claim 1 recites:

"A plating system comprising:  
an elongated upper channel and an elongated lower channel; and  
a plating solution horizontal sparger comprising a series of inlets oriented to  
direct any plating solution flowing through the inlets into one and towards  
another of the upper and lower channels."

Claim 15 recites:

"A plating system comprising:  
an anode, a planar cathode, a horizontal sparger, and a plurality of electrically  
insulating shields; wherein  
each of the plurality of shields is positioned between the anode and the cathode  
but not between the sparger and the cathode, and each of the plurality of  
shields is approximately co-planar with one of two reference planes that  
are substantially parallel to the cathode; and  
the sparger is adapted to direct plating fluid toward and edge of the cathode  
along in a plane substantially co-planar with cathode."

As pointed out in the Specification, an improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields forming the sides of the channel).

As the Specification also specifically points out, the system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 – and Applicant's Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried. These modifications to the Technic system render the claims of the current application patentable over Technic, because Technic cannot possibly render unpatentable the modifications disclosed in the current system and recited in the claims, because one of ordinary skill in the art would not view the Admitted Prior Art alone or in combination with Lace and arrive at the present disclosure or claims.

The Applicant believes, after reviewing the Examiner's Answer, that the Examiner is merely assembling puzzle pieces to arrive at a whole "prior art reference",

and the Examiner is also improperly deconstructing claim 1 of the present application to arrive at the goal the Examiner wishes to reach.

#### **REVIEWING THE INDEPENDENT CLAIMS AS A WHOLE**

First, it is important to read claim 1 as a whole. Claim 1 states that a plating system comprises the following: a) an elongated upper channel and an elongated lower channel; and b) a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels. (emphasis added) The original specification, on page 4, states that the shields 130 form narrow upper and lower plating channels through which the parts being plated move with each part having one edge positioned within the upper plating channel and an opposite edge positioned within the lower plating channel. Two things are apparent from a fair reading of this claim: 1) a distinct/separate elongated upper channel is formed and a distinct/separate elongated lower channel is formed, and 2) the plating solution is flowing into one of the channels and toward another channel – not flowing toward the face of the piece to be plated, as is the case with Applicant's Admitted Prior Art.

#### **PROPOSED CLAIMS AMENDMENTS FOR CONSIDERATION BY EXAMINER/BOARD**

The Applicant could amend claim 1, in part, to state the following:

an elongated upper channel and an elongated lower channel through which a part to be plated moves with the part having an edge positioned within the upper channel and an opposite edge positioned within the lower channel, or

an elongated upper channel formed by a plurality of upper shields and an elongated lower channel formed by a plurality of lower shields, wherein each channel is separated by a gap between the upper and lower shields.

The Applicant does not believe that either amendment presented above is necessary, because as the Applicant contends, the claim provision does in fact speak for itself and does not read on Applicant's Admitted Prior Art alone or in combination with Lace; however, the Applicant respectfully presents two options shown above that either the Examiner or the Board could accept and recommend. If the Examiner believes one of these options is acceptable, the Applicant will withdraw the Appeal through the filing of a Request for Continued Examination that includes one of the above amendments, along with any proposed amendments presented in the previous section. It should be clear, however, that the Applicant is respectfully seeking to work with the Examiner in this case to move this matter forward to allowance, instead of wasting resources through the Appeal process. If, however, the Examiner does not agree with the Applicant's arguments or proposed amendments, then the Applicant is satisfied asking the Board to review the matter and make a reasoned recommendation or determination.

#### THE LACE REFERENCE & MOTIVATION TO COMBINE

Lace et al. (US Patent 4772371) discloses an electroplating apparatus for high-speed electroplating a cathodic strip of metal passed therethrough. The Lace reference discloses electrolyte fluid holes under the shield (Reference Number 46 in Figure 2 of Lace), but the fluid is not directed into one of an elongated upper channel or an elongated lower channel and towards the other, as claim 1 recites. Given that the

shields are positioned *completely perpendicular* to the cathode and anode, and that the cathode physically travels through the middle of the shield, it isn't clear why one of ordinary skill in the art would review Lace and just pull out the idea of an electrolyte fluid hole at the bottom of the compartment. There must be some motivation in Applicant's Admitted Prior Art that would lead to a combination with Lace, and given that the arrangement is Lace is completely different from anything shown in Applicant's Admitted Prior Art – the Applicant is not seeing the motivation to combine.

One interesting note in the motivation to combine debate is that if Lace included vertical spargers in a position to direct flow onto the cathodic strip (Reference Number 66 in Figure 1 of Lace), those spargers would be in position in each chamber formed by the electrically insulating shields (Reference Number 46 in Figure 2 of Lace), positioned to hit the cathode with electrolyte fluid as it exits the shield, and wouldn't require that the chambers be enlarged at all, based on the Figures shown (see specifically the space formed between the anodes 68 and 70 and the electrolyte fluid hole (not so numbered in Figure 2) on the bottom of the chamber). In the current application, one of the features of the horizontal spargers is to narrow the upper and lower channels by bringing the shields closer to the cathode, which is claimed in the dependent claims of the present application. That feature would not be necessary nor chosen in Lace, because the shield is perpendicular to the cathode, which moves right through the middle of the shield. The problem solved by Lace is really completely different than the problem solved by the current application and Claims 1 and 15, and therefore, one of ordinary skill in the art wouldn't read Lace with the motivation to combine it with Applicant's Admitted Prior Art to solve the problem that Claim 1 solves in the current application.

### **DEVELOPMENT OF TECHNIC MP 300 PLATING SYSTEM**

In addition, the Examiner cites the Applicant's Admitted Prior Art as the primary reference – the Technic MP 300 system, and then states that this system does not explicitly disclose the flow is in a plane substantially coplanar with the cathode. The Examiner then relies on the disclosure of Lace et al. to fill that gap in the Applicant's Admitted Prior Art. It is interesting to note that the Lace reference was issued in 1988. The Technic MP 300 development followed the issuance of the Lace reference, along with the issuance of several patents directed to vertical spargers, including US 5985123. Those of ordinary skill in the art of continuous plating obviously didn't consider Lace during the development of the Technic MP 300 or, according to the Examiner's logic, they would have obviously used the horizontal sparger system developed by the Applicants. This analysis applies directly to the continuing conversation directed to a motivation to combine the references, which the Applicants continue to assert just isn't apparent.

### **IMPROPER HINDSIGHT RECONSTRUCTION**

So, the question becomes whether the Examiner is improperly combining the references, without apparent motivation, through hindsight reconstruction. The Federal Circuit stated in *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1784 (Fed. Cir. 1992)(quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)):

"It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention".

The Court then said in *In re Dembiczak* (175 F.3d 994, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citing *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)), cert denied, 469 US 851 (1984)): "measuring a claimed invention against the standard established by section 103 requires the oft-difficult but critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and then accepted wisdom in the field." Close adherence to this methodology is especially important in the case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." (*In re Dembiczak*) A general relationship between fields of the prior art references to be combined is insufficient to establish the suggestion or motivation. (See, e.g. *C. R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). The Court in *Mc Ginley v. Franklin Sports Inc.*, 262 F.3d 1339, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) (citing *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) stated:

"The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some "teaching, suggestion or reason" to combine cited references...When the art in question is relatively simple, as is the case here, the opportunity to judge by hindsight is particularly tempting. Consequently, the tests of whether to combine the references need to be applied rigorously."

The invention that was made, however, does not make itself obvious; that suggestion or teaching must come from the prior art. (See, e.g. *Uniroyal, Inc. v. Rudkin-*

Wiley Corp., 837 F.2d 1044, 1051-52, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988)). This standard would also be acceptable under the KSR v. Teleflex obviousness standard.

Given that the Technic MP 500 was developed "Post Lace", the problems to be solved in Lace and Applicant's Admitted Prior Art were different, and other art in the field were developing these plating systems in the same manner as Technic, it stands to reason that the accepted wisdom in the field was not considering Lace as a viable option to utilize in the system developed by Technic (Applicant's Admitted Prior Art). In addition, it would stand to reason that Lace was not a viable option to utilize in combination with the Applicant's Admitted Prior Art (Technic MP 500) in the system developed by the current Applicants.

#### **CLAIM 15 ANALYSIS**

Turning to Claim 15, it recites in part: "A plating system, comprising: an anode, a planar cathode, a horizontal sparger, and a plurality of electrically insulating shields; wherein each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode...". Claim 15 is specific and very clear about the position of the shields. This claim virtually eliminates Lace as a prior art reference, because Lace places the shield (Reference Number 46 in Figure 2 of Lace), between the electrolyte fluid holes (Not Referenced in Figure 2, but shown in front of and under the shield) and the cathode (Reference Number 66 in Figure 1 of Lace). The shields in Lace are necessarily positioned to break apart the channel and to form even compartments (see Column 4, lines 9-31 of Lace). Lace does not contemplate arranging the shields with respect to the anode, cathode and sparger, as does Claim 15 and the current application. Therefore, it seems that the placement of the electrolyte

fluid holes in Lace, in combination with the requirement that the shields are aligned perpendicular to the anode and cathode and form compartments, would lead one of ordinary skill in the art not to consider Lace when reviewing Applicant's Admitted Prior Art for potential improvements and modifications. Pulling the electrolyte fluid holes out of Lace and putting them in a vacuum in combination with Applicant's Admitted Prior Art is improper hindsight reconstruction. The Applicant respectfully asks the Examiner and the Board to put the Lace reference into context, as to what one of ordinary skill in the art is looking for when developing new technologies.

#### **CONCLUSION**

One of ordinary skill in the art would not read Applicant's Admitted Prior Art and Lace, alone or in combination, and find the motivation, suggestion or teaching to produce the plating system of claims 1 and claims 15 of the Applicant's present application. In addition, claims 2-14 are also allowable by virtue of their dependency on independent claim 1.

#### **APPLICANT'S RESPONSE TO EXAMINER'S ANSWER (10) RESPONSE TO ARGUMENTS**

The Applicant herein responds to the specific points raised on Page 10, Section 10 entitled "Response to Argument" in the Examiner's Answer.

The "series of inlets" issue that was raised in the last 2 paragraphs on page 10 and the first paragraph of page 11 has been addressed in the prior sections.

The "comprising" language issue has been dealt with in both of the sections above, especially with respect to the vertical versus horizontal spargers.

The Applicant would like to address in detail the contention that the advantages presented by the Applicant in the prior response are limitations that should be in the claims, but not otherwise considered. The Applicant respectfully disagrees. The Applicant pointed out the advantages of the present plating technology and how it solves the problem presented by Applicant's Admitted Prior Art. These advantages are meant to give the reader and the Examiner the reason for the technical solution to the problem presented in the prior art. They are not meant to be "limitations" that need to be a part of the claims.

As a matter of fact, the MPEP §707.07(f) states that the Examiner must consider the asserted advantages and state the reasons for his or her position on the record. It is not clear that the Examiner actually considered these advantages, but merely dismissed them as not claimed and therefore, not considered.

"After an Office action, the reply (in addition to making amendments, etc.) may frequently include arguments and affidavits to the effect that the prior art cited by the examiner does not teach how to obtain or does not inherently yield one or more advantages (new or improved results, functions or effects), which advantages are urged to warrant issue of a patent on the allegedly novel subject matter claimed.

If it is the examiner's considered opinion that the asserted advantages are not sufficient to overcome the rejection(s) of record, he or she should state the reasons for his or her position in the record, preferably in the action following the assertion or argument relative to such advantages. By so doing the applicant will know that the asserted advantages have actually been considered by the examiner and, if appeal is taken, the Board of Patent Appeals and Interferences will also be advised. See MPEP § 716 et seq. for the treatment of affidavits and declarations under 37 CFR 1.132.

The importance of answering applicant's arguments is illustrated by *In re Herrmann*, 261 F.2d 598, 120 USPQ 182 (CCPA 1958) where the applicant urged that the subject matter claimed produced new and useful results. The court noted that since applicant's statement of advantages

was not questioned by the examiner or the Board of Appeals, it was constrained to accept the statement at face value and therefore found certain claims to be allowable. See also *In re Soni*, 54 F.3d 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995) (Office failed to rebut applicant's argument)."

The Applicant contends that the Examiner did not properly review and address the asserted advantages, but instead considered them limitations to be included in the claims, which they clearly are not, in some cases. The Examiner should also note that many of the proposed amendments presented herein take into account some of these advantages, and therefore, it may be wise for the Examiner or Board to allow this case to proceed to prosecution, so that these claims may be entered and discussed, and so that this case may finally proceed to allowance. The Applicant respectfully asks the Examiner to either state that these advantages, in whole or in part, should be a part of the claims or should say that he has taken them into account and does not consider them as having merit in this review. Its not clear from the Examiner's comments whether they were not considered because they were not part of the claims or whether they were considered and should be a part of the claims.

The Applicant has addressed Examiner's assertions on page 11, last paragraph regarding the Lace reference and its applicability in this case.

#### **NEW GROUND OF REJECTION**

The Applicant isn't sure what the Examiner means by the first full paragraph on page 12, other than to suggest a new ground of rejection, and therefore, the Applicant is filing a Petition under 37 CFR 1.181(a) to have this matter considered in order to protect the Applicant's rights. The Applicant does not remember seeing this assertion by the Examiner in previous Office Actions and questions whether it can be presented

at this time without invoking the Applicant's rights to request that prosecution be reopened.

To address this issue, the Examiner stated that he is not relying on the vertical spargers to meet the horizontal sparger of the instant claims, the plurality of shields 13 of Admitted Prior Art is not between the sparger and the cathode as stated in claim 15. As mentioned earlier, Claim 15, it recites in part: "A plating system, comprising: an anode, a planar cathode, a horizontal sparger, and a plurality of electrically insulating shields; wherein each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode...". (emphasis added). The Applicant is not clear as to what the Examiner is saying. Is he giving a sidebar on what the Admitted Prior Art includes or doesn't include, or is he saying that Claim 15 is somehow trying to refer to the Admitted Prior Art? The statement "the plurality of shields 13 of Admitted Prior Art is not between the sparger and the cathode as stated in claim 15" leaves the impression that the Examiner believes the Claim 15 is trying to co-opt the Admitted Prior Art. Claim 15 is what it is – it recites, in part, a plating system having a plurality of shields, wherein each of the plurality of shields is positioned in one way, but not another, in an effort to be clear.

Given that the Applicant is willing to work with the Examiner to arrive at a set of allowable claims, and has even provided proposed claims amendments for consideration, the Director should consider this final point to be a new ground of rejection and allow the Applicant to petition to open prosecution. The Applicant believes that a decision of this kind would be the ideal use of the resources of the Office.

Dated: November 6, 2007

By:

Respectfully submitted,  
Buchalter Nemer, A Prof. Corporation



Sandra P. Thompson, PhD, Esq.

Reg. No. 46,264

E-mail: [sthompson@buchalter.com](mailto:sthompson@buchalter.com)

Direct Line: 949-224-6282

ATTORNEYS FOR APPLICANT(S):

Buchalter Nemer, A Professional Corporation  
18400 Von Karman Ave., Suite 800  
Irvine, CA 92612  
Fax: 949-224-6203

**APPENDIX OF PENDING CLAIMS**

1. (Previously Presented) A plating system comprising:  
an elongated upper channel and an elongated lower channel; and  
a plating solution horizontal sparger comprising a series of inlets oriented to  
direct any plating solution flowing through the inlets into one and towards  
another of the upper and lower channels.
2. (Original) The system of claim 1 further comprising:  
an anode; and  
a substantially planar cathode comprising a first surface conductive surface, a  
second conductive surface, and a perimeter edge, the first conductive  
surface and second conductive surfaces being substantially parallel to  
each other and positioned on opposite sides of the cathode; wherein  
the sparger is positioned at least as close to the perimeter edge of the cathode  
as to either of the first or second conducting surfaces.
3. (Original) The system of claim 2 wherein the sparger directs any plating solution  
flowing through the inlets towards the cathode in a plane substantially coplanar  
with the cathode.
4. (Original) The system of claim 3 wherein:  
each of the upper and lower channels comprises two substantially planar and  
parallel non electrically conductive sides that are substantially parallel to  
the cathode; and  
the cathode is positioned at least partially within each of the upper and lower  
channels between the non electrically conductive sides.
5. (Original) The system of claim 4 wherein:

the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots; and  
the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots.

6. (Original) The system of claim 5 wherein the egress slots are positioned approximately parallel to a center line of the cathode.
7. (Original) The system of claim 6 wherein the cathode comprises a dielectric substrate and the conductive surfaces are adapted to promote the formation of heat spreaders on the dielectric substrate.
8. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to one inch.
9. (Previously Presented) The system of claim 1 wherein the horizontal sparger directs any plating solution flowing through the inlets into the lower channel and towards the upper channel.
10. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches.
11. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches, and the further comprising a plurality of part holding clamps electrically coupled to a power source and positioned within the upper channel or the lower channel.
12. (Original) The system of claim 1 further comprising a plurality of anodes positioned outside and along the length of the upper and lower channels.

13. (Original) The system of claim 1 wherein the upper channel and lower channel are separated by a distance and at least one of the upper channel and lower channel are adapted to be moved to vary the distance.
14. (Original) The system of claim 1 wherein the shortest distance from a part being plated to a channel wall is less than the shortest distance between the channel wall and an anode.
15. (Previously Presented) A plating system comprising:  
an anode, a planar cathode, a horizontal sparger, and a plurality of electrically insulating shields; wherein  
each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode; and  
the sparger is adapted to direct plating fluid toward and edge of the cathode along in a plane substantially co-planar with cathode.

Claims 16-18: Canceled.

**EVIDENCE APPENDIX**

There is no additional evidence at this time of which the Applicant's are aware.

**RELATED PROCEEDINGS APPENDIX**

There are no related proceedings at this time of which the Applicant's are aware.